OCEAN GALES AND STORMS, MARCH, 1932—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued			° ′	° ′				*Inches*					
Stuart Dollar, Am. S. S.	Manila	Los Angeles	33 44 N	159 24 E	Mar. 20	4 a, 21	Mar. 21	29.35	SSW	WSW, 7	WNW	WNW, 9	WSW-WNW.
Golden River, Am. S. S.	Hong Kong	San Francisco	[1] 39 00 N	150 00 E	do	—, 20	do	29.14			NNW	NNW, 10	
San Luis Maru, Jap. M. S.	Kudamatsu	Los Angeles	46 08 N	177 49 E	Mar. 21	Noon, 21	do	28.27	SE	SE, 4	W	E, 9	SE-E-SE.
California, Am. S. S.	Darien	San Francisco	45 30 N	169 00 W	do	7 a, 21	do	28.77	SE	SSE, —	S	SE, 10	SE-SSE-S.
Granville, Pan. M. S.	Los Angeles	Yokohama	34 20 N	174 43 W	do	4 a, 21	do		WSW	WSW, 8	W	—, 9	
Courageous, Am. M. S.	Shanghai	San Pedro	43 25 N	157 35 W	do	8 p, 21	do	29.31	ENE	SSW, 8	SW	SSE, 10	S-SSW.
Ozura Maru, Jap. M. S.	Yokohama	Los Angeles	37 32 N	152 35 E	Mar. 20	Mdt, 20	Mar. 22	28.55	SE	SW, 6	NW	NW, 11	SE-SW-W.
Bonneville, Nor. M. S.	Bacolod, P. I.	San Pedro	33 45 N	165 55 E	Mar. 21	4 a, 21	do	29.38	SSW	SW, —	WNW	W, 9	
Adm. Peoples, Am. S. S.	Portland	San Diego	44 19 N	124 20 W	Mar. 23	6 a, 24	Mar. 24	29.85	SE	S, 9	SW	S, 9	S-SW.
San Pedro Maru, Jap. M. S.	Yokohama	San Francisco	45 05 N	176 30 W	Mar. 24	4 a, 25	Mar. 26	29.20	WNW	WNW, 7	WSW	WNW, 10	WNW-WSW.
Granville, Pan. M. S.	Los Angeles	Yokohama	34 20 N	165 00 E	Mar. 26	8 a, 26	Mar. 27		W	W, 10	NW	W, 11	
Grays Harbor, Am. S. S.	Legaspi, P. I.	Los Angeles	34 40 N	159 11 E	do	Noon, 26	do	29.45	W	W, 10	NW	W, 10	W-WNW.
Sangstap, Nor. M. S.	San Pedro	Yokohama	33 45 N	169 30 E	do	2 p, 26	Mar. 28	29.51	S	S, 9	NW	W, 10	S-SW-W.
Do	do	do	33 37 N	161 20 E	Mar. 29		Mar. 30		SE		S	S, 9	SE-S.
Silverwalnut, Br. M. S.	San Francisco	do	44 00 N	162 25 E	do	Mdt, 29	do	29.35	SW	SSW, —	WSW	W, 10	S-SSW.
SOUTH PACIFIC OCEAN													
Aorangi, Br. M. S.	Auckland	Honolulu	15 26 S	178 26 W	Mar. 11	Noon, 11	Mar. 12	29.33	SE		NW	WNW, 11	

[1] Position approximate.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—The average atmospheric pressure in the region surrounding the Aleutian Islands was approximately half an inch lower in March than in February. While in the earlier month the average barometer was nearly a third of an inch above the normal, in March it was 0.17 inch below, at both Dutch Harbor and St. Paul. The average center of the LOW this month was near Dutch Harbor, where the mean pressure was 29.53 inches. Along the coast of the United States and over the islands lying immediately south of Japan, pressures for March were somewhat above the normal.

The North Pacific anticyclone fluctuated greatly in stability and area, and from the 4th until nearly the middle of the month was practically nonexistent over the region usually occupied by it in west longitudes, its place being taken by comparatively shallow but extensive cyclonic developments.

In the Far East the continental anticyclone encroached considerably upon the sea area, but was more broken than during the winter by depressions both of continental and of oceanic origin.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean and adjacent waters, March, 1932, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [2]	30.30	+0.15	31.02	11	29.70	31
Dutch Harbor [1]	29.53	−0.17	30.30	8	28.98	19
St. Paul [1]	29.56	−0.17	30.29	9	28.76	31
Kodiak [1]	29.60	−0.09	30.22	8	28.86	18
Juneau [1]	29.91	−0.03	30.42	1	29.36	18
Tatoosh Island [3] [4]	30.00	+0.04	30.45	21	29.38	24
San Francisco [3] [4]	30.11	+0.05	30.34	24	29.75	14
Mazatlan [1] [2]	29.92	−0.07	30.04	13	29.76	6
Honolulu [3]	30.03	−0.01	30.17	23	29.75	8
Midway Island [1]	30.05	−0.02	30.48	29	29.72	13
Guam [1]	29.89	−0.01	29.96	4	29.82	20
Manila [1]	29.89	−0.06	30.00	1	29.80	27
Naha [1] [2]	30.10	+0.10	30.28	20	29.80	27
Chichishima [1]	30.05	+0.05	30.18	[5] 26	29.70	28
Nemuro [1] [2]	29.83		30.26	11	29.52	[5] 27

[1] Data based on 1 daily observation only, with departures computed from best available normals related to time of observation.
[2] Data for 1 to 3 days missing.
[3] A. m. and p. m. observations.
[4] Corrected to 24-hour mean.
[5] And on other date.

Cyclones and gales.—Anticyclones were fewer than normal in middle and higher latitudes this month, and the progressive movement of many cyclonic formations was relatively slight. The pressures in some individual cyclones reached considerable depths locally on some days. However, in many cases a cyclone of moderate depth covered an enormous area, resulting in a wide distribution of unsettled weather, accompanied with more or less sporadic high winds.

In general the heaviest weather, as gathered from reports in hand, occurred between about 30° and 45° N., except that there were comparatively few gales east of longitude 150° W. In these latitudes gales were most frequent west of the one hundred and eightieth meridian, where some 5° squares had at least four days with winds of force 9 to 10.

In only two instances were gales as high as force 11 reported. That of the 26th came with a westerly wind and was experienced by the Panaman motorship *Granville* near 34° N., 164° E.

The factors making up the storm which resulted in the heavy gale of the 21st were a depression, which was of little consequence during its passage between China and Japan on the 18th and 19th, and a LOW which had been hanging simultaneously over northern Japan and the lower Kurile Islands. The two appear to have coalesced east of Honshu on the 20th, with resultant and rapid increase in energy. The storm became so violent locally on the 21st that on that morning, near 37½° N., 153° E., the Japanese motorship *Ozura Maru* encountered a northwest gale of force 11, with barometer depressed to 28.55 inches. On the same date, but in connection with a different storm center, the motorship *San Luis Maru*, near latitude 45° N., longitude 180°, reported a pressure of 28.27 inches (uncorrected), which was the lowest observed barometer reading of the month. In this case the maximum wind force, from the east, was only 9. Southeasterly gales of force 10, also on the 21st, were experienced as far to the eastward as latitude 157° W. This day may be considered as most generally the stormiest of the month.

A period of more scattered though less intense gales was that between the 6th and 10th. During the 6th and 9th winds of force 8 to 9 occurred off the upper coast of the United States; from the 6th to 8th similar forces were encountered over a considerable area north and north-

east of the Hawaiian Islands; strong gales occurred on the 6th to 10th between about 39° N. and the central Aleutians; and strong to whole gales blew on the 6th, 8th,and 9th over a varying stretch of sea between southern Japan and about longitude 170° E.

A glance at the adjoined table of storms and gales will sufficiently call attention to other high winds outside of the Tropics and indicate as well the far less degree of storminess prevailing over the North Pacific than over the North Atlantic this month.

Tehuantepecers.—In the Gulf of Tehuantepec northers of moderate gale force were experienced on the 6th, 12th, 17th, and 28th; of fresh gale force on the 10th; and of whole gale force (10) on the 13th and 14th, during the prevalence of an anticyclone over the western part of the Gulf of Mexico. Off the middle Central American coast a northeaster of force 7 occurred on the 16th.

Tropical cyclones.—No tropical cyclones of consequence occurred this month, but a depression southwest of Guam caused a northwest gale of force 9 on the 2d.

Fog.—There were 10 or more days with fog this month off the central California coast within 100 miles of San Francisco and 7 days within a similar distance of San Diego. Along the upper California and the Oregon and Washington coasts fog was reported on 11 days altogether. Between longitudes 130° and 170° W. latitudes 35° and 50° N., 1 to 4 days with scattered fog, distributed through the month, were experienced in the majority of the 5° squares. The most interesting weather record of March is that relating to the occurrence of dense fog on the 4th to 7th in the Gulf of Panama. Not before in recent years has this phenomenon been reported by seamen in this locality.

CYCLONES IN THE SOUTH INDIAN OCEAN, FEBRUARY, 1932

The London Meteorological Magazine for March, 1932, reports from the Times of February 6–10 that a hurricane which crossed the island of Reunion on February 5 is said to have been the worst ever experienced there. It resulted in the death of at least 45 persons.

Mr. D. Depledge, third officer of the British motor vessel *Athelempress*, en route from England to Java, via the Cape of Good Hope, reports encountering a cyclone on February 15–16. At midnight of the 15th the ship's position was in latitude 31° 15′ S., longitude 53° 24′ E. The gale began from ESE. at 3:20 a. m. of the 16th, and was of force 9 from a southeasterly direction from about 6 a. m. until noon, the vessel then being in 30° 58′ S., 53° 33′ E. The barometer was lowest, 29.32 inches, at 3 p. m., at which time the wind dropped and veered to SW., later increasing to force 8, then changing to NW. by N., force 9. The weather began improving at midnight of the 16th. This storm was moving apparently toward the southwest, which is the usual direction taken by tropical cyclones in these latitudes in the Indian Ocean.

SEA-SURFACE TEMPERATURE OBSERVATIONS, MARCH, 1932

By GILES SLOCUM

Table 1 shows the average surface temperatures of the Caribbean Sea and the Straits of Florida for March, 1932. These figures are based upon about 80 per cent of the observations which will eventually become available. They are, therefore, preliminary, rather than final values. The final revised figures, computed from complete data, will be given at a later date.

CARIBBEAN SEA

The mean surface temperature of the Caribbean Sea for March, 1932, was above the seasonal average throughout the month. This was the warmest March, next to that of 1931, during the 13 years of record (1920–1932), and the twenty-fifth consecutive month with the mean temperature at, or above, the seasonal average.

STRAITS OF FLORIDA

The extremely high sea-surface temperatures, for this season of the year, which prevailed in the Straits of Florida during February, 1932, continued until about March 9. From then until the end of March the temperature anomaly was not more than a few tenths of a degree, although the departures remained positive in sign until the end of the third quarter-month. During the final quarter of the month, however, the average temperature was 0.4° below the 13-year mean. This was the first time a quarter-monthly mean temperature for the Straits of Florida area had been below the seasonal average since the second quarter of November, 1931.

TABLE 1.—*Preliminary mean sea-surface temperatures (°F.) in the Caribbean Sea and Straits of Florida, March, 1932*

Quarter	Period	Caribbean Sea			Straits of Florida		
		Mean (°F.)	Departure from 13-year mean (1920–1932)	Change from preceding month	Mean (°F.)	Departure from 13-year mean (1920–1932)	Change from preceding month
I	Mar. 1–7	79.2	+0.8		76.3	+2.4	
II	Mar. 8–15	79.6	+1.0		75.2	+0.5	
III	Mar. 16–23	79.3	+0.4		75.8	+0.5	
IV	Mar. 24–31	79.7	+0.6		75.3	−0.4	
	Month	79.4	+0.6	+0.7	75.6	+0.7	−1.2